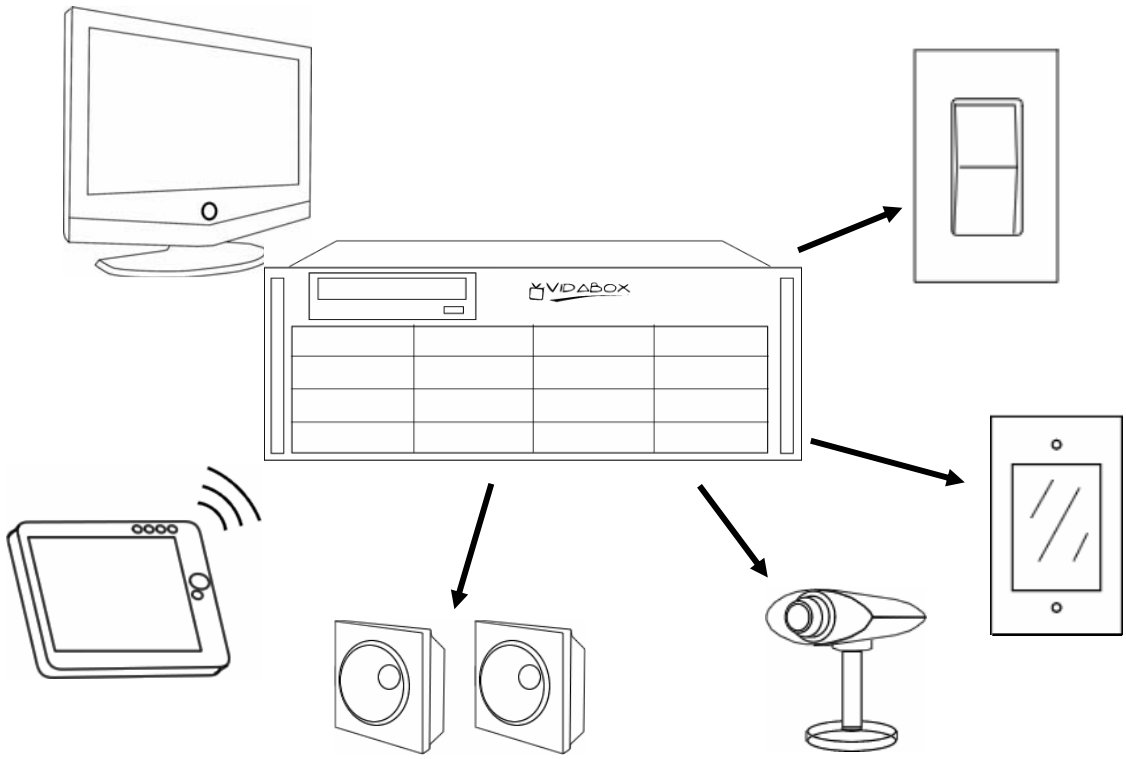
VIDABOX

vAUTOMATION
W. MCONTROL™



VidaBox & vAutomation Application Example

EHX Spring 2008 – Demo Room 240A

This guide covers complete distributed audio, video, lighting, security, and control systems using vAutomation™ software from VidaBox™. Design examples, diagrams, & technical information are included.

General Overview

Media Center technology provides a great way for customers to store and manage their digital pictures, camcorder videos, music, and movies using a simple, easy to use interface. Having all your digital content stored in one system and being able to stream that content all over the house makes Media Center extremely desirable for today's digital lifestyle. Media Center can be a stand-alone product but it many times ends up being only one part of a much larger integration project. Many of today's "smart homes" include features such as multi-room audio, video distribution, AV component control, lighting control, IP cameras, and security control just to name a few. Integrating Media Center technology in these projects can be challenging with many potential pitfalls if not design properly.

It was our goal at EHX Spring 2008 to show a home integration example that would meet many of today's typical smart-home requirements using Media Center technology. This integration example featured various VidaBox media centers, mControl from Embedded Automation for home automation and AV control, Casatunes by Casatools for control of the NuVo multi-room audio equipment, in-wall and wireless touch screen, and rack hardware to simplify management of Media Centers placed in the rack.

Scope of this Document

This document will cover all the various hardware and software products placed in the Media Center demo section of the of the VidaBox™ Demo Alley Room, including full layout and wiring diagrams. We hope that is documentation will be used as reference material and a starting point for designs involving Media Center technology.

While VidaBox makes the best effort possible, note that the following are to be used as a guide only – it is ultimately the dealer/integrator's responsibility to assure all of the components in the system are compatible and working properly.

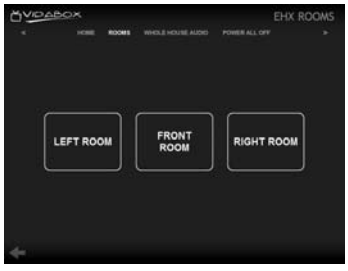
Design Goals and Requirements

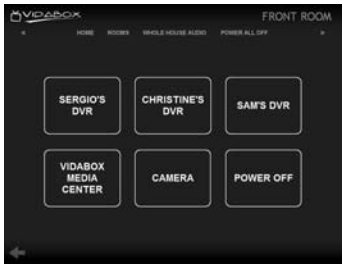
A. Provide a central server for storage of digital pictures, video, music, and movies. Storage of movies to include high definition formats (HD DVD & Blu-ray).
B. Provide independent access to digital content stored on the server in all three rooms including HD DVD and Blu-ray movies. AKA - Media Center in each room.
C. Provide three (3) family members with their own personal DVR (digital video recorder). Family members personal DVR must be accessible from any of the three rooms.
D. Stream digital music stored on the server throughout the house. Speakers used for TV viewing must also be able to be used for the multi-room music playback.
E. Provide simple in-wall keypad control in three of the rooms.
F. In-wall touch screens in three of the rooms for complete home, AV and multi-room audio control.
G. Three wireless touch screens for complete home, AV and multi-room audio control.
H. All audio/video equipment to be rack mounted when possible. Customer does not want equipment in the room.
I. Be able to control room lights and table lamp in each room from Media Center and the touch panels. Wants to possibly expand on the lighting system in the future.
J. IP cameras in three rooms of the house.
K. Provide a screen and keyboard in the rack so customer can manage all Media Centers and copy content at the rack.
L. Provide high quality sound for three of the rooms using high-end audiophile-grade equipment.

Software solution

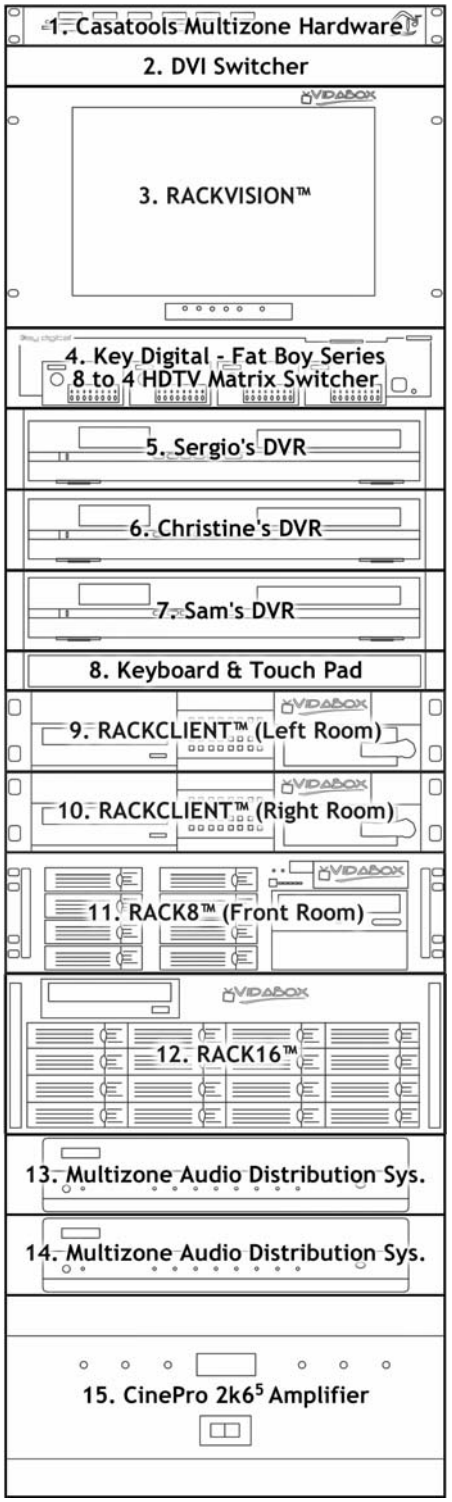
- **Multi-Room Audio Control:**
  - *CasaTunes™:* The CasaTunes software by CasaTools provides the ability to stream digital music stored on the VidaBox server to NuVo® or Russound® multi-room audio systems. The CasaTunes software will allow for complete control of the NuVo® or Russound® system from within Media Center or any device that can browse a webpage such as our vPad or in-wall touch screens. The control is not limited to one room as with the NuVo® or Russound® keypads but allows for control of any zone in the house from the CasaTunes user interface.
  - *How CasaTunes is used in this example:* CasaTunes is installed on the VidaBox RACK8 (#11) system in the main rack. The RACK8 is connected to the NuVo Grand Concerto using a serial cable from the RACK8 serial port to the serial port on the Grand Concerto. CasaTunes controls the Grand Concerto using this serial connection and gets status information from the Grand Concerto. Three analog audio connections are made between the RACK8 and the three source inputs on the Grand Concerto. This provides the actual analog audio feed that the Grand Concerto works from. CasaTunes indexes all the music stored in the RACK8 automatically and makes it available for playback. The CasaTunes webservice is installed on the RACK8 and all clients will link to the RACK8 to access the CasaTunes user interface. The RACKCLIENTS, vPads and in-wall touch-screens are all pointed to CasaTunes for whole house audio control.
- **Home Automation and AV Control:**
  - *mControl™:* Embedded Automation's mControl software turns any Vidabox Media Server into a fully featured home automation controller.
    Some of mControl's capabilities include:
    - RS232 control using RS232 ports on the VidaBox or Global Cache GC100 adapters.
    - IR control using Global Cache GC100 or USB-UIRT adapter connected to the VidaBox.
    - Lighting control using Z-Wave, INSTEON, and X10 technologies.
    - IP control of other Media Centers on the network
    - IP Camera integration
    - Sprinkler control
    - Security system integration

    Please see reference the appendix at the end of this document for a full list of hardware compatibility for mControl
  - *How mControl is used in this example:* mControl is installed on the VidaBox RACK8 (#11) in the main rack. Any equipment that is controllable via RS232 is connected to the RACK8's serial inputs. Additional serial inputs were added to the rack RACK8 by using USB to serial adapters. A USB Z-Wave adapter is connected for control of Z-Wave lighting control. A Global Cache GC100 is placed on the network for IR control of the DVR boxes (#5-7) and serial control of the Key Digital Matrix switcher (#4). A serial connection was made between the RACK8 and the NuVo essential (#13). Lastly, a Media Center IP control program is installed on all the VidaBox Media Centers for IP based control of Media Center from mControl. With all the connection made, mControl has full control of all the equipment and can also respond to events fired by different pieces of equipment.
- **Custom Touch Screen Control interface:**
  - *vAutomation™:* VidaBox's vAutomation software provides a fully customizable front end for mControl that is optimized for use with touch screens. vAutomation provides a set of web based template pages that can be easily customized by editing an XML definition file. These template pages can be completely modified to add/remove buttons, change button and page titles, and change but press action. Button press actions can fire mControl macro or commands, navigate to another vAutomation page, or navigate to a web page outside of vAutomation.
  - *How vAutomation is used in this example:* The goal for this demo project was to provide a simple, easy to use interface for controlling the different pieces of AV equipment in the different rooms as well as providing media rich control of the multi-room audio. Big buttons with good title descriptions were used wherever possible for simplicity and to minimize the learning curve of using the interface. A room page was created where each rooms specific piece of equipment could be selected for viewing and control. Selecting the specific piece of equipment would fire a mControl macro to turn on the TV, switch the TV to the correct input, reset the volume of the zone to a normal level and then present a remote emulator page to provide control for the device. Furthermore, side navigation links are provide to provide quick links to common actions such as turning on lights, powering down the zone, or jumping to shortcuts such as My Music.





Hardware Solution – Rack Area


1. Casatools Multizone Hardware
2. DVI Switcher
3. RACKVISION™
4. Key Digital - Fat Boy Series 8 to 4 HDTV Matrix Switcher
5. Sergio's DVR
6. Christine's DVR
7. Sam's DVR
8. Keyboard & Touch Pad
9. RACKCLIENT™ (Left Room)
10. RACKCLIENT™ (Right Room)
11. RACK8™ (Front Room)
12. RACK16™
13. Multizone Audio Distribution Sys.
14. Multizone Audio Distribution Sys.
15. CinePro 2k6⁵ Amplifier

As is typical with many of todays home integration projects, most of the hardware equipment is placed in a main rack. The following is a list and description of the hardware placed in the rack and exhibited at EHX Spring 2008.

1. CasaTunes XLe Multizone Audio Hardware (option)
- a. 4 external sources + 5 audio streams from internal sound card, 12 zone matrix switch.
- b. Works in conjunction with CasaTools XLi sound card for up 5 independent audio streams.
- c. This could be used instead of the NuVo Essentia (#13).

2. DVI Switcher
- a. 1 x 4 KVM switch with USB keyboard support.
- b. The 3 video outputs of each VidaBox Media Center are plugged into the switch. The output from the switch is feed to the RACKVISION display.

3. VidaBox™ RACKVISION15™
- a. 15” rackmount LCD screen (6U), 19” (9U) option available.
- b. Connects to the KVM switch to provide local video access each of the VidaBox Media Centers placed in the rack.
- c. Inputs: NTSC/PAL, Composite, Component, S-Video, VGA

4. Key Digital® Fat Boy® 8 to 4 HDTV Matrix Switcher
- a. Component Matrix Switch with 4 input and 8 outputs including L/R & PCM audio inputs. RS232 & IR control options.
- b. Used to switch the 3 DVRs.

5-7. Digital Video Recorders

8. Rack-mount Keyboard & Touch Pad

9-10. RACKCLIENT™ Professional Media Extender
- a. 2U tall & less than 20" deep
- b. BD/HD/DVD 1080p video upscaling w. HDCP
- c. Video outputs: HDMI, Component, DVI, & VGA
- d. Audio outputs: Digital optical/coaxial SPDIF & 7.1 analog out
- e. Field serviceable & upgradeable storage
- f. Pre-configured to connected to any VidaBox server system
- g. Install a ROOMDISC™ for local room DVD/CD/USB access

11. RACK8™ Professional Media Server
- a. 3U tall & 26" deep
- b. Field serviceable and upgradeable to 7.0TB of RAID5 protected storage space
- c. BD/HD/DVD playback to 1080p video upscaling w. HDCP
- d. Native HDMI out w. both video & audio
- e. Fully compatible w. any VidaBox extender

12. RACK16™ Professional Media Server (high storage option)
- a. 4U tall & 26" deep
- b. Field serviceable and upgradeable to 14.0TB of RAID6 protected storage space
- c. BD/HD/DVD playback to 1080p video upscaling w. HDCP
- d. Native HDMI out w. both video & audio
- e. Fully compatible w. any VidaBox extender

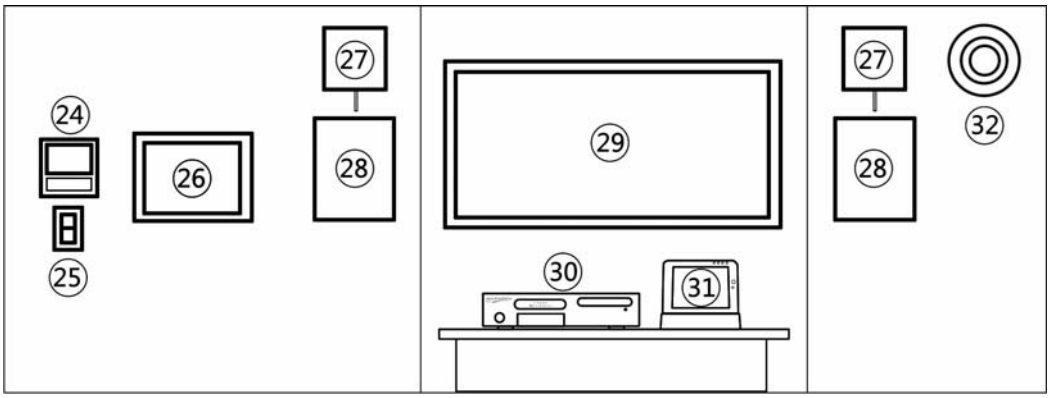
13. NuVo Essentia
- a. Six source, six zone audio distribution system.
- b. Used simply as a 6 source, 3 zone matrix switch control from mControl. Could have used CasaTools XLe system instead.

14. NuVo Grand Concerto
- a. Six source, eight zone audio distribution system.
- b. Used to provide 3 independent music stream for multi-room audio system control by CasaTunes. The 3 outputs from the essential system a connected to last three remaining sources. mControl controls the last three sources for volume control and switching audio into each of the three zones.

15. CinePro 2k6^5 Amplifier
- a. 6 channel amplifier, 300 watts/channel.
- b. Used for amplification all the speakers in each room.

Hardware solution – Rooms

The following is a list of the equipment placed in the front "room" of the Media Center demo area of the EHX spring 2008 demo room. All the "rooms" were nearly identical, so we will only cover the front room in this section.



24. NuVo In-wall Keypad
- a. Standard keypad for the NuVo Grand Concerto.
- b. Provides local multi-zone audio control including power, volume control, and song/playlist selection.
- c. The CasaTunes software provides full metadata information to the keypads of the song that is currently playing.

25. Leviton ViziaRF Z-Wave dimmer
- a. Dimming control of the wall sconces.
- b. Controllable via Z-Wave from mControl installed in the VidaBox RACK8.
- c. Lights can be controlled from Media Center and vAutomation. vAutomation is accessible from the vPAD or the in-wall TOUCHCLIENTS.

26. Vidabox In-Wall TOUCHCLIENT
- a. Uses thin client technology and terminal services running on VidaBox SLIM v2 (30). One SLIM v2 can run up to 10 TOUCHCLIENTS.
- b. Only requires power and CAT5 for connection to the LAN.
- c. Custom configured to launch vAutomation control screen on boot-up.
- d. 800x600 or 1024x768 video resolution options.

27. Wall Sconces – Lighting
- a. Connected to Leviton ViziaRF Z-Wave wall dimmer (23).

28. CinePro® Mighty speakers
- a. Audiophile quality speakers with 8" woofers.
- b. Connected to Cinepro's high power, high quality 2k6[5] amplifier.
- c. One set of speakers are used in the room for TV viewing and playing back whole-house audio.
- d. Sources for audio playback are switched by the two NuVo systems at the rack and input into the Cinepro amp.
- e. Volume control is done by mControl and the NuVo Grand Concerto.

29. 42" 1080p Television
- a. The VidaBox RACK8 Media Center is connected via HDMI.
- b. The component output from the Key Digital matrix switch is connected to the TV's component input.
- c. Source selection and TV power status is controlled via RS232 by mControl installed on the RACK8.

30. VidaBox SLIM v2 with Win XP
- a. In this case, the SLIM v2 is dedicated to the TOUCHCLIENTS and cannot run as an extender.
- b. Running Windows XP and nComputing terminal Service software for TOUCHCLIENT support.
- c. Directly drive a VGA-USB based touch screen in the left room.

31. VidaBox vPAD Wireless tablet
- a. Runs windows XP embedded.
- b. Provides access to custom vAutomation control interface for whole house control.
- c. 2.5 hour battery life
- d. Includes convenient charging cradle.

32. AXIS 212PTZ IP security camera
- a. 800 x 600 resolution
- b. Pan, tilt, zoom function
- c. Viewable from any internet browsers, from mControl in Media Center, and from the VidaBox vPAD tablet.

33. Other (not labeled)
- a. Media Center USB IR receiver is placed under the TV for MCE remote control.
- b. Table lamp connected to a Leviton ViziaRF Z-Wave wall plug dimmer. Controlled via mControl.

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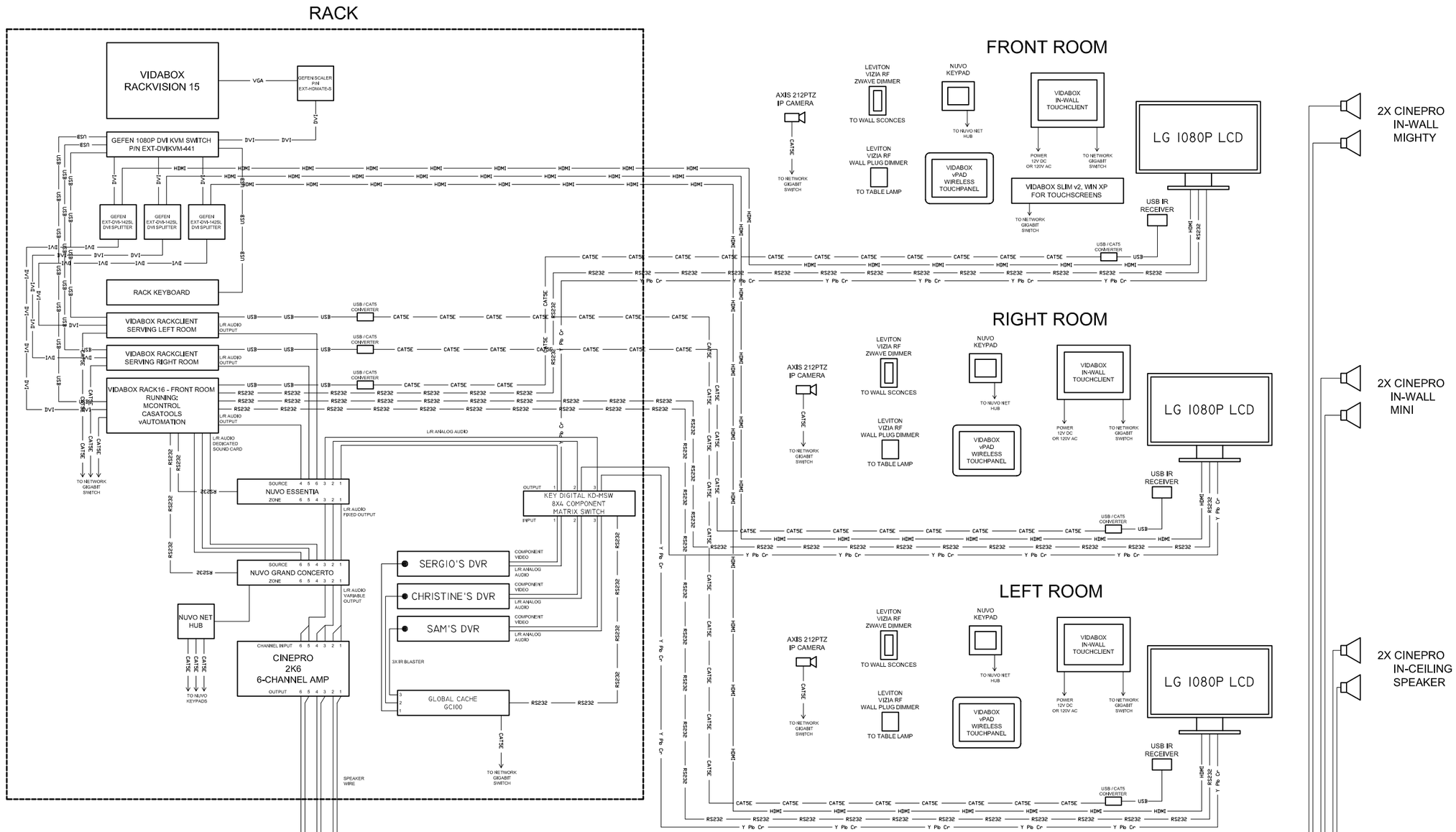


General Notes

No.	Revision/Issue	Date

Firm Name and Address

VIDABOX LLC
100 SHAMES DR.
SUITE 3
WESTBURY, NY 11590
516-730-7500
WWW.VIDABOX.COM

Project Name and Address

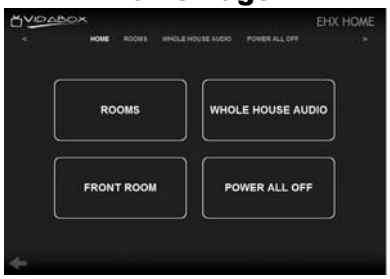
MEDIA CENTER DEMO AREA
EHX SPRING 2008
DEMO ROOM 240A
ORANGE COUNTY
CONVENTION CENTER

Project	Sheet
Date	
Scale	

Solution - vAutomation Interface

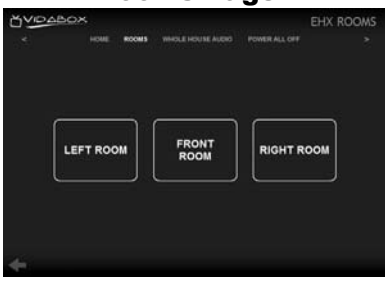
The following is a brief overview of the different vAutomation screens that were designed for the EHX Spring 2008 application example.

Home Page



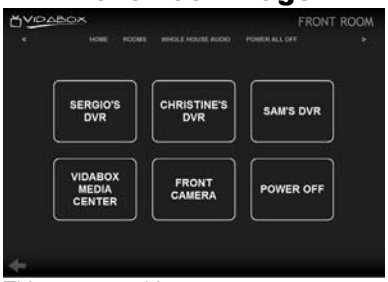
The home page is the starting point for access to all the automation in the house. Clicking on the “ROOMS” link brings you to the “Rooms Page” described next

Rooms Page



The “Rooms Page” provides links to the equipment placed in the specific rooms. In this example, all the rooms are pretty much the same. Clicking the “FRONT ROOM” button brings you to the page described next.

Front Room Page



This page provides access to room specific or shared equipment as with the DVRs. Clicking the DVR links will bring up the remote emulator for the DVR and provide control for the DVR. Clicking the VidaBox Media Center link will bring up the Media Center remote control emulator. The camera button brings up the camera for viewing. “POWER OFF” will power off the equipment in this specific zone.

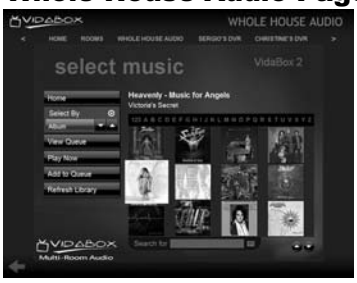
Sergio’s DVR Page

The loading of the page fires an onload event that in turns fires an mControl macro that will switch all the AV components to the correct inputs for sound and video. After this page loads, it provides full control of the DVR by provide a remote emulator on the touch screen. This page also includes buttons on the side for common controls tasks such as turning lights on and off.

Front VidaBox Page

Like the previous page, the loading of this page will fire a mControl macro that in turn will switch all the video and audio to the correct inputs for the RACK8 connected to the front room. After loading, the page provides a full Media Center remote control emulator for control of the RACK8 media center from the tablets.

Whole House Audio Page

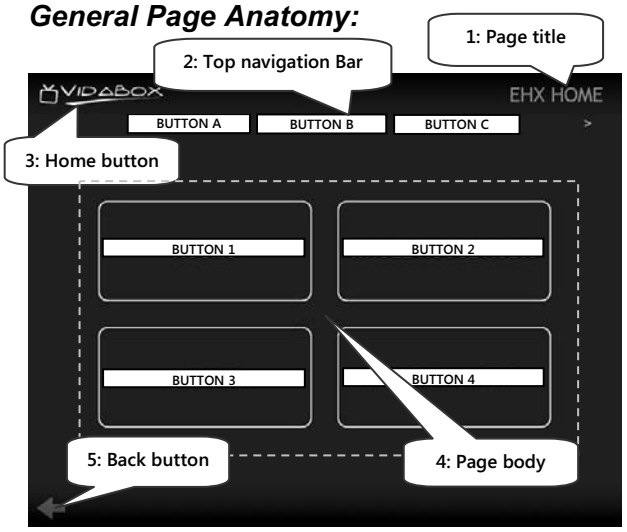


Clicking “Whole House Audio” will load a vAutomation page that will host the CasaTunes multi-zone audio control interface. Having the CasaTools interface hosted within vAutomation gives the advantage of still having custom buttons across the top navigation bar to jump to other vAutomation screens if needed.

vAutomation™ Overview

VidaBox's vAutomation software provides a fully customizable front end for mControl that is optimized for use with touch screens. vAutomation provides a set of web based template pages that can be easily customized by editing an XML definition file. These template pages can be completely modified to add/remove buttons, change button and page titles, and change but press action. Button press actions can fire mControl macro or commands, navigate to another vAutomation page, or navigate to a web page outside of vAutomation.

General Page Anatomy:

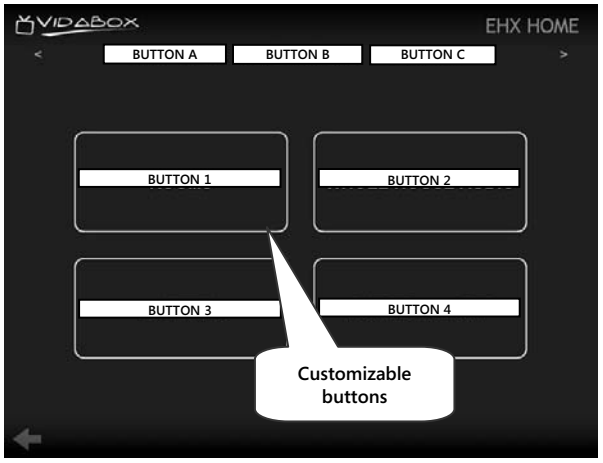


Every vAutomation page is defined by an XML definition file. The XML definition file will define all the elements on the page, what the elements will look like and what they will do when clicked.

All vAutomation pages will contain the following:

1. ***Page title –*** customized for each page
2. ***Top navigation bar*** – buttons can be added and the title modified. Standard navigation bars can be created and carried over multiple pages.
3. ***Home button*** – Clicking the VidaBox logo brings the user back to the vAutomation home page.
4. ***Page body*** – The page body will change depending on the template used. Templates are defined in the next sections.
5. ***Back button*** – Navigates to the previous page.

Multi-Button Template:



This multi-button template allows you to define and configure multiple buttons in the body of the page. The buttons will be equally sized and spaced on the page according to the attributes defined in the XML file.

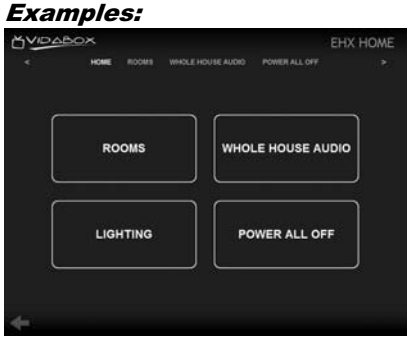
In the XML file you can define:

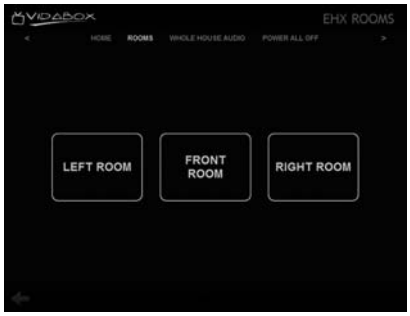
1. The number on buttons on the page
2. The number of rows and columns of buttons
3. The overall height and width of the button group
4. mControl macro to fire when page loads
5. Button press action

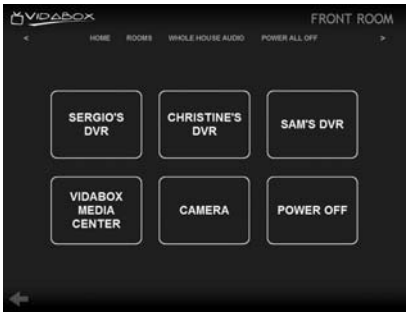
Button press actions can be:

1. Navigation to another vAutomation page
2. Navigation to an external webpage
3. Fire an mControl macro or command

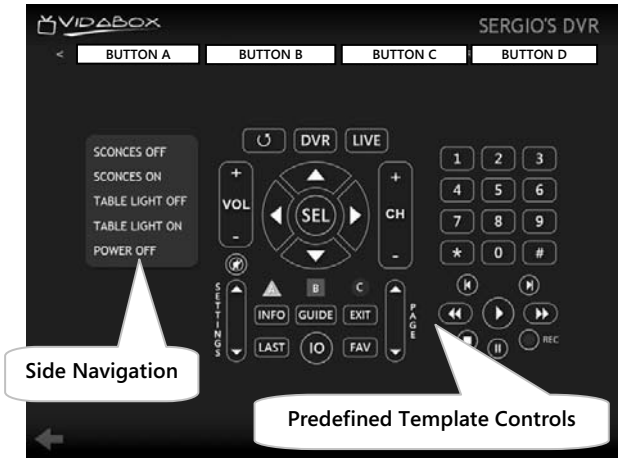
Examples:







RC1 Cable-satellite box/DVR Template:



This is a remote emulator template for most common cable and satellite boxes and DVRs. The buttons on this template are pre-designed with fixed placement. This template also adds a side navigation bar to provide extra buttons for common page specific tasks.

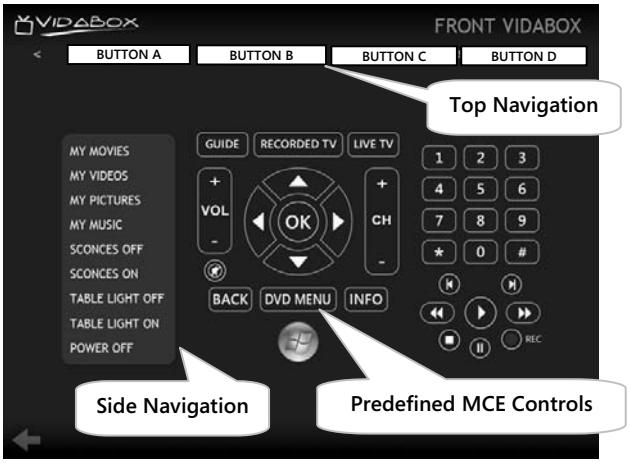
In the XML page definition file you can:

1. Specify the standard adapter configured in mControl where the button press commands should be sent to.
2. Change the default command of any button on the page to a different mControl command.
3. Add customized button in the side navigation bar.
4. Specify a different image for the button.
5. Disable buttons from showing on the page.
6. Specify a custom top navigation bar if desired.

Side and top navigation bar button press actions can be:

4. Navigation to another vAutomation page
5. Navigation to an external webpage
6. Fire an mControl macro or command

RC2 Media Center Control Template:



This is a remote emulator template for Media Center control. The buttons on this template are pre-designed with fixed placement. This template also adds a side navigation bar to provide extra buttons for common page specific tasks.

In the XML page definition file you can:

1. Specify the standard adapter configured in mControl where the button press commands should be sent to.
2. Change the default command of any button on the page to a different mControl command.
3. Add customized button in the side navigation bar.
4. Specify a different image for the button.
5. Disable buttons from showing on the page.
6. Specify a custom top navigation bar if desired.

Side and top navigation bar button press actions can be:

1. Navigation to another vAutomation page
2. Navigation to an external webpage
3. Fire an mControl macro or command

Note: We will be adding the ability to browse the music, movies, video, and picture collection within the page with cover art for music and movies. Music, videos, and movies can be queued for playback right from the page.

Hosted page Template:

This template provides the ability to host an external web page within a vAutomation page. This page keeps the top and bottom navigational buttons available while loading a second external webpage in its body. This is perfect for linking to specific mControl pages such as camera pages or specific Zone pages for CasaTunes.

Appendix

- **More info on Embedded Automation's mControl**
  - For a complete list of mControl-compatible hardware, supported protocols & devices, please their website at: http://embeddedautomation.com/EAHAmControl.htm

- **More info on CasaTool's CasaTunes**
  - For a complete list of compatible hardware for use with CasaTunes, please their website at: http://www.casatools.com

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